



UNITED STATES PATENT AND TRADEMARK OFFICE

CD
UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/086,786	02/28/2002	Russell B. Stuber	L13.12-0174/01-262	8978
7590	03/30/2006			EXAMINER KING, JUSTIN
Sandeep Jaggi LSI LOGIC CORPORATION M/S D-106 1551 McCarthy Boulevard Milpitas, CA 95035			ART UNIT 2111	PAPER NUMBER DATE MAILED: 03/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/086,786	STUBER ET AL.	
	Examiner	Art Unit	
	Justin I. King	2111	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 09 January 2006.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-16 is/are pending in the application.
 - 4a) Of the above claim(s) 9-16 is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-4, 6 and 7 is/are rejected.
- 7) Claim(s) 5 and 8 is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 09 January 2006 is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 1/9/06.
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: _____.

DETAILED ACTION

Allowable Subject Matter

1. Examiner withdraws the allowable subject matter in the previous Office Action in view of updated search.
2. Claims 5 and 8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form **including all of the limitations of the base claim and any intervening claims.**

Referring to claims 5 and 8: the prior arts on record do not disclose or explicitly teach a look-ahead split release apparatus with a structure of a counter providing the validation register the empty status of the return command register, and the validation register inhibits the validation when receives the empty indication from the counter.

3. Applicant is reminded to cancel the withdrawn claims in the event that the Application is in the condition of allowance.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of the admitted prior art and Marisetty (U.S. Patent No. 5,574,868).

Referring to claim 1: The admitted prior art discloses that the slave device has queued several commands it is unable to service within a prescribed criterion, and the slave device releases one of the split master devices when the slave device is ready (Specification, page 2, last paragraph). The slave device's means for queuing the commands is equivalent to the command register, and the slave device's means to release the split master masters is equivalent to the claimed control device. The admitted prior art does not explicitly disclose a staging register for storing a master device's identification whose command is highest in order.

Marisetty discloses an early bus request scheme (figure 4). Marisetty discloses that the split transaction bus is a well-known system component (column 1, lines 26-28); Marisetty further discloses that response time is increased due to the sequential nature of the read, bus arbitration, grant, and data transmission operations (column 2, lines 15-17). Marisetty teaches one to improve and reduce such latency by implementing an early bus grant prediction technique (column 2, lines 28-41). Marisetty discloses a FIFO to store the retrieved data; the stored data is equivalent to the identification of a master device (column 2, lines 28-41). Hence, it would have been obvious to one having ordinary skill in the computer art at the time Applicant made the

invention to adapt Marisetty onto the admitted prior art because Marisetty teaches one to improve and reduce such latency by implementing an early bus grant prediction technique.

Referring to claim 2: Marisetty discloses early bus arbitration (figure 4). Since the slave device must remove the block from the requesting master device so the master device can re-arbitrate the bus (Specification, page 2, lines 18-23), Marisetty teaches comparing the identification of the master device and releases the split of that master device.

7. Claims 3-4 and 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of the admitted prior art, Marisetty, and Duran et al. (U.S. Patent No. 5,058,006).

Referring to claims 3 and 6: The disclosures of the admitted prior art and Marisetty are stated above; neither discloses the validation register. Duran discloses a practice of request filtering. Duran discloses filtering the number of invalidates to be propagated onto the bus (abstract, column 5, lines 21-29). Duran discloses that processing every transaction may saturate the busload in preserving the data coherency (column 4, last three paragraphs, column 5, first three paragraphs). Duran teaches servicing of invalidates for every transaction would occupy a large amount of shared system resources. Duran's means to filter invalidates is equivalent to the claimed validation register. Hence, it would have been obvious to one having ordinary skill in the computer art at the time Applicant made the invention to adopt Duran's teaching onto the admitted prior art and Marisetty because Duran teaches one to reduce the loading on the shared system resources by filtering the number of invalidates to be propagated on the bus.

Referring to claims 4 and 7: Durdan discloses that the interface unit monitors the system bus and detects transactions. Durdan's bus transactions are equivalent to the commands from the master devices, and Durdan's interface unit's invalidation handling is equivalent to the claimed response to a command from the master device.

Response to Arguments

8. In response to Applicant's argument that Applicant's invention reduces overall latency by allowing re-arbitration of the system buys for the next master device, which is initiated by commencement of the next master device (Remark, page 9, 2nd paragraph): The claimed limitation merely claims "next-ordered" instead of re-arbitrating or commencement of the next master device as argued. The argued limitation is not explicitly a part of the claimed limitations.

9. In response to Applicant's argument that the FIFO do not identify a master device (Remark, page 10, 2nd paragraph, lines 5-6): In order to properly forward and to transmit the data/request in the FIFO, the system has to be able to identify the associated master device for each entry in the FIFO. Hence, Marisetty's FIFO's stored information is equivalent to the identification of a master device.

10. In response to Applicant's arguments that prior arts on record do not disclose or teach the claimed limitations in claims 3-4 and 6-7 (Remark, page 11, 2nd paragraph): As stated above, Durdan discloses a practice of request filtering. Durdan discloses filtering the number of invalidates to be propagated onto the bus (abstract, column 5, lines 21-29). Durdan discloses that processing every transaction may saturate the busload in preserving the data coherency (column 4, last three paragraphs, column 5, first three paragraphs). Durdan teaches servicing of

invalidates for every transaction would occupy a large amount of shared system resources.

Durdan's means to filter invalidates is equivalent to the claimed validation register. Durdan discloses that the interface unit monitors the system bus and detects transactions. Durdan's bus transactions are equivalent to the commands from the master devices, and Durdan's interface unit's invalidation handling is equivalent to the claimed response to a command from the master device.

11. In response to Applicant's argument that nothing in the prior arts discloses the Durdan's teaching might be applied to split transaction in the admitted prior art or Mareisetty (Remark, page 12, 1st paragraph): In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Durdan discloses the importance issue of the possible saturation of the busload in preserving the data coherency. Durdan discloses servicing of invalidating every transaction would occupy a large amount of system resource; Durdan thus teaches filtering the request to prevent saturating busload; Durdan's filtering meaning is equivalent to the claimed validation register.

12. In response to Applicant's argument that Durdan's teaching only involves with a private bus, not the system bus as used by the claimed split transaction (Remark, page 12, 2nd paragraph, lines 5-8): Durdan's invention is not to be construed as limited to the particular form disclosed

discloses the invalidation process (Abstract), and Durdan discloses the importance issue of the possible saturation of the busload in preserving the data coherency in any transaction with the processor. Thus, one having ordinary skill in the computer art would have adopted Durdan's teaching onto the admitted prior art and Marisetty because Durdan teaches one to reduce the loading on the shared system resources by filtering the number of invalidates to be propagated on the bus.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent No. 6,256,694 to Fenwick et al.: Fenwick discloses a distributed early arbitration for accessing a system bus of a computer system.

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

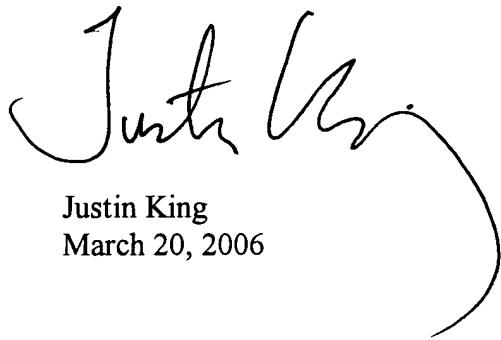
15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Justin I. King whose telephone number is 571-272-3628. The examiner can normally be reached on Monday through Friday, 9:00 am to 5:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Cottingham can be reached on 571-272-7079 or on the central telephone number, (571) 272-2100. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

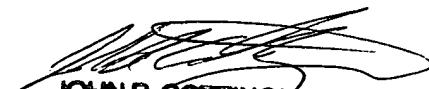
Lastly, paper copies of cited U.S. patents and U.S. patent application publications will cease to be mailed to applicants with Office actions as of June 2004. Paper copies of foreign patents and non-patent literature will continue to be included with office actions. These cited U.S. patents and patent application publications are available for download via the Office's PAIR. As an alternate source, all U.S. patents and patent application publications are available on the USPTO web site (www.uspto.gov), from the Office of Public Records and from commercial sources. Applicants are referred to the Electronic Business Center (EBC) at

Art Unit: 2111

<http://www.uspto.gov/ebc/index.html> or 1-866-217-9197 for information on this policy. Requests to restart a period for response due to a missing U.S. patent or patent application publications will not be granted.



Justin King
March 20, 2006



JOHN D. COTTINGHAM
PRIMARY EXAMINER